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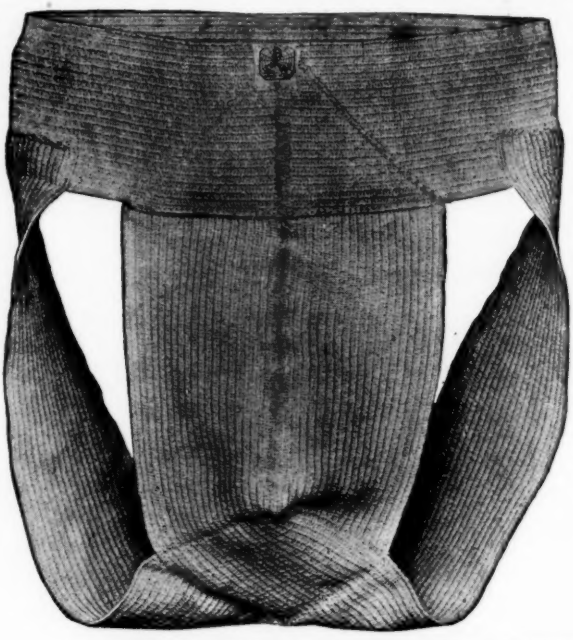

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THE ATHLETIC JOURNAL

A PROFESSIONAL MAGAZINE FOR THE COACHES OF THE COUNTRY

JOHN L. GRIFFITH, EDITOR

VOLUME II MARCH, 1922 NUMBER 7

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The ATHLETIC JOURNAL

Vol. II CHAMPAIGN, ILLINOIS No. 7

SOME SUCCESSFUL BASKETBALL PLAYS

ONE of the most important things in basketball is to develop a system of offense whereby the team can advance the ball down the floor for a shot at the basket. If the coach has a definite system in mind and the players thoroughly understand it he can easily make minor changes in it for special games and thus the opponents who may be trying to play the system will find themselves completely deceived and handicapped. It is not necessary that a coach should develop an intricate system of plays but rather that a plan which is basically sound should be outlined. In the first place when the ball is obtained in the back court from an intercepted pass or a missed shot the other four men on the team, viz.: those who do not have the ball should take some sort of formation so that the fifth member (the man with the ball) can pass somewhere without delay.

The following diagrams suggest one formation which has proven successful after the break from defense to offense and a few methods of advancing the ball from the original formation. In each case it is assumed that player number 1 obtains the ball first in the back court and then passes to one of his team mates who has taken up a certain position when the break was made. In most of these plays the reverse turn and short pass is employed. The movements in all of these plays must be executed quickly and the ball should be worked down the floor if possible before the defense gets set.

Diagram No. 1 shows the position that the players should assume in this system of offense as soon as possible when one of the players—in this case No. 1—gets the ball off the backboard or intercepts a pass in the back court. When this happens, 2, 3, 4, and 5 should take up

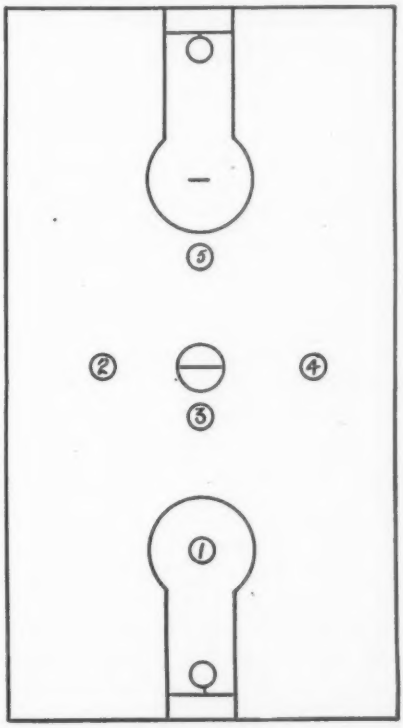


Diagram I

positions as quickly as possible, as shown in the diagram. The point to be emphasized here is that as soon as the break comes the men on offense must be in the positions designated. No. 1 then should always have one of these men uncovered to receive a pass.

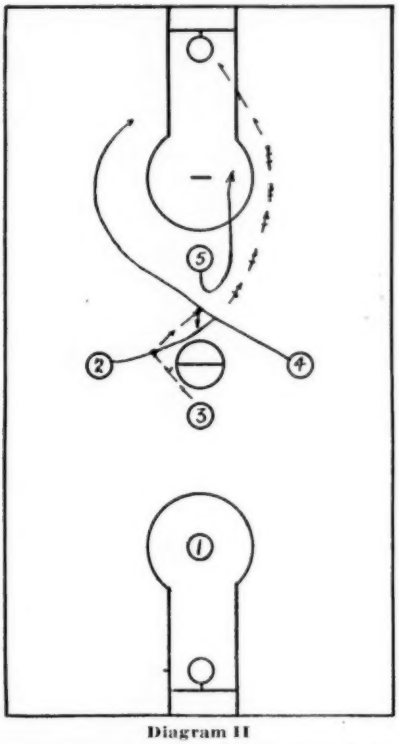


Diagram II

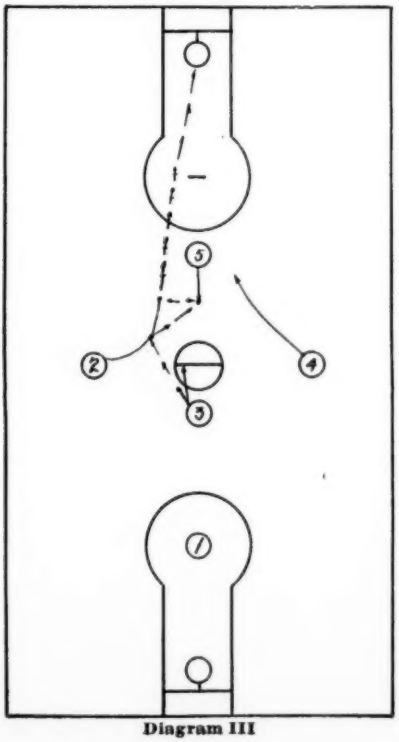


Diagram III

No. II.

No. 3 passes to No. 2, who is crossing in front of him; No. 2 passes to No. 4; No. 4 passes right back to No. 2; No. 2 dribbles in for a shot.

No. III.

No. 3 passes to No. 2; No. 2 passes to No. 5, who comes out to meet him; No. 5 passes right back to No. 2, who dribbles in for a shot.

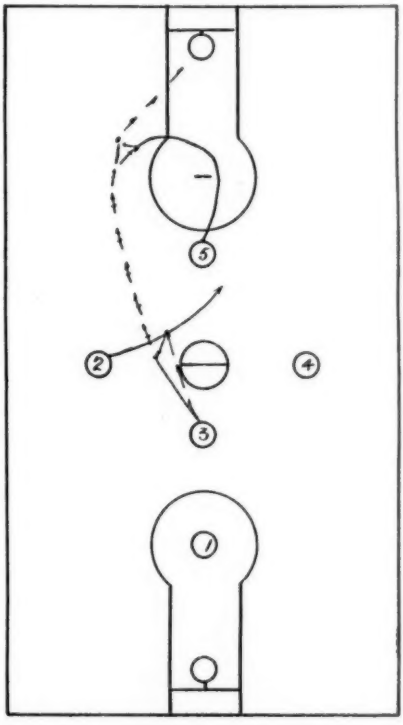


Diagram IV

No. IV.

No. 3 passes to No. 2 and cuts behind him; No. 2 passes right back to No. 3, who dribbles toward the basket. If he is not cut off he goes in for a shot; if he is cut off he passes to No. 5; No. 5 passes right back to No. 3, who goes in for a shot.

(Concluded on Page 25)

TOURNAMENT PLAY

THIS is the season which brings the climax of the basketball year for many school teams in the final championship tournaments. For the most part the teams that are not eliminated early in the matches are the ones that have been well grounded in fundamentals—the men handle the ball cleanly, at least one or two can hit the baskets, they have well defined methods of advancing the ball down the floor, they all break well in changing from offense to defense, and vice versa, and finally they have a good defense. Granting that a team has mastered these rudiments, and if it has not it is too late to do much now to perfect the fundamentals, there are a few things that a coach may well consider in relation to the tournament.

First, the coach must decide whether to make the trip to the tournament a day early to give the players a chance to work out on the strange court and to save them from traveling the day of the first game. If the journey is only a short one, it is usually best to make the trip the day of the game, for young athletes will rest better in their own beds than in strange ones, and they can almost always have a chance to try the floor and the baskets in plenty of time before being called upon to play. There are usually a number of distractions in the town or city where the tournament is held, and the wise coach will keep his players away from these as much as possible.

Second, a great deal of care should be exercised to see that the men have plain food to eat before the matches. It is a mistake for them to eat a heavy meal before they play. Most young athletes eat too much when away on trips. Then, too, they should not be allowed to become weary visiting friends, seeing sights or in watching the other teams play. It is a good thing for the coach to see possible rivals in the latters' contests, but in most cases it is better for the players to be given plenty of rest rather than required or permitted to watch the other games.

The coach will see to it that his team's equipment is suitable for the conditions it will meet in its games. If the floor is very slippery, he may rub a little alcohol or gasoline on the bottom of his men's rubber-soled shoes just before they go out on the floor. This destroys the compound in the shoes, but it will make them hold to the floor. If the light in the gymnasium is bad, and his team's jerseys are of a color that makes them indistinct against the background formed by the spectators, he should have them wear shirts of a bright color that can be readily seen.

Third, regarding the games which the team will have to play to win the tournament, it is well to win each one in turn, and not to start substitutes in any doubtful game. It is better to start the best players and then save them by substituting freely after the game is safely won, than to start the second string men and then have to put the regulars in to pull the game out of the fire.

A great deal may be learned by studying the other teams' methods of playing. If the team that is to be played later has a system of advancing the ball down the court the players should be instructed how best to break up this team play and at the same time it may be well to change your systems of play for the purpose of deceiving your opponents.

Many games are won in the last few minutes of a game. If a team has a lead and there are only a few

(Concluded on Page 21)

DRIBBLING

BY
PAUL J. DAVIS
Director of Physical Education, the University of North Dakota

DRIBBLING is one of the most spectacular and fascinating things in basketball, both from the standpoint of the player and spectator. It may be made a very important factor in the success of a winning team, provided, of course, that the team in question has men on it who can dribble and, what is equally important, men who know when to use the dribble and when to stop dribbling for a pass or shot.

On the other hand, dribbling has a tendency to break up team play. There is nothing so demoralizing to a team as to have on it a man or a number of men who try to use the dribble on any and all occasions. When this condition exists, the other men on the team do not know what to do and all chance for organized play is lost. Where I have seen one chance for a shot from close range brought about by fair dribbling, I have seen five chances for a shot thrown away because the dribble was used when the passing game would have been better. Dribbling has the same fascination for a basketball player that long end runs have for a football player, and many high school players have to learn each year that they cannot run around end when up against good opposition without a lot of help from their teammates. This also applies to the basketball player who thinks that he can dribble through any number of men at any and all times. This type of player never takes his teammates into consideration except that he expects them to give him the ball whenever he wants it. You seldom ever see this type of player on a team that has a real coach, but he is to be found on many school teams that have been improperly coached.

For the past two seasons I have been fortunate in having a real dribbler. He never abused the privilege granted him as a dribbler; yet, good as he was, he was only permitted to dribble under certain conditions and in certain zones. In playing teams that used the five-man defense (and most of them do in the Northwest), whenever the ball was obtained from an intercepted pass, from an out-of-bounds play or off the opponent's backboard, it was passed to the dribbler who in turn dribbled until two players had penetrated the defense. That is, he would dribble up close to the defensive men, stop his dribble and pass to one of the teammates who had penetrated the defense; or, if they were covered, pass back to the floor guard. The floor guard would in turn dribble up to the defense and look for a chance to pass to a teammate who was behind the defense or try for a shot at the basket.

Following are some suggestions about the use of the dribble:

1. Do not dribble in defensive territory, but rather make a pass to the center of the floor.

2. Where a player does not have an opportunity to make a pass, he may dribble to draw a defensive man so as to make a pass possible.

3. Where a player has an open lane to the basket, he should dribble in for a short shot.

4. When a man is dribbling, he should always pass to a teammate who calls for the ball. If the latter is not in a good position to receive the ball, he is to blame and not the dribbler.

5. A team should look for a chance to pass rather than a chance to dribble, but the dribble should be used when it is impossible to pass.

6. The dribble should be used a

(Concluded on Page 24)

HURDLE RACING

BY

JOHN P. NICHOLSON

Mr. Nicholson, now Director of Athletics at the University of the South, at Sewanee, Tennessee, was an all around track man in his college days at the University of Missouri. He could always be counted upon to win points in dual meets in the jumps and hurdles, especially the latter, in which he excelled. He was one of the best hurdlers in this country, and ran on the Olympic team at Stockholm.—EDITOR'S NOTE.

AFTER a college dual meet, I heard a lady make the followlowing remark relative to the high hurdle race: "The loser of the race looked so pretty as he jumped the hurdles, but the man who beat him so far merely ran over them."

Unconsciously, she uttered the greatest truth about hurdling, namely, the closer we can possibly get to running over the hurdles, the faster we get through the race.

There are three hurdle races on the National A. A. U. program, *i.e.:* 120-yard high hurdles, which are three feet six inches high, fifteen yards from the start to the first hurdle, a like distance from the last hurdle to the finish, and ten yards between hurdles; 220-yard low hurdles, two feet six inches high, twenty yards to the first hurdle, between, and to the finish; and 440-yard hurdles, which are three feet high, and forty yards apart. In all these races there are ten hurdles to be taken.

The correct number of strides between the hurdles for a championship performance are: three strides between high hurdles, taking the hurdles on the fourth; seven strides between the low hurdles, taking the hurdles on the eighth; and fifteen strides between the 440-yard hurdles.

A hurdler should be an all-round track athlete. The good hurdler will invariably be found to be a good sprinter, jumper or weight thrower. He must possess some "sand", as at the beginning at least he must take his share of bruised knees and ankles, and an occasional "spill". I think a coach can always make a respectable hurdler out of a willing boy who can run the "century" near 10 3-5 seconds, and is from five feet nine inches in height to six feet three inches. Thomson, the great, is a little taller than this, but the usual athlete of this height is usually too ungainly to get the proper recovery after taking the hurdle.

What constitutes a *running* stride before we take the high hurdles? As the runner's back foot leaves the ground it is straightened momentarily, then the knee comes forward in front of the foot, from here the leg and thigh nearly straighten in reaching for the stride, following which as the toe is about to hit the ground the leg bends in a *pull.* During this time the body is kept slightly forward of the perpendicular, so that walking and running are a series of falls and catching one's balance. During this the arms, working loose from the shoulder and slightly bent at the elbow, are moved in the same plane as the legs, only that the right arm is moved synchronously with the left leg.

We will assume that the hurdler takes the hurdle with his right leg first. Personally, I start all my boys with the left leg foremost, for then they will have a big advantage over the right-legged hurdler when it comes to running 220 hurdles around a curve. But over the high hurdles, there is a matter of choice.

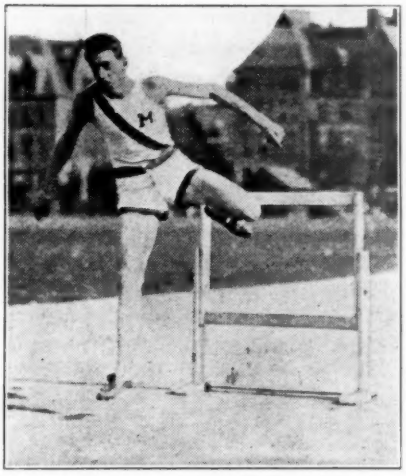
Now if one were to take my description of a running stride and do exactly that, with the exception that in order to get over the hurdle, the left thigh is thrown parallel to the hurdle along with the left foot, one would be taking the hur-

dle correctly. In order to get the left thigh parallel and at right angles to the right leg, the hips should roll slightly to the left. Also the forward bend of the body should be exaggerated, so that the trunk is thrown forward at the hips even so far as to sometimes touch the right shoulder as one rises. This bend forward gives to the hurdler what the "layout" gives to the high jumper, "lifts him up by his boot straps." The trunk should be kept forward all through the taking of the hurdle. Thomson, in "warming up" easy over the hurdles seems to fall over them, regaining his balance as if by a miracle. But this fall should come mostly on the ascent to the hurdle.

NICHOLSON CLEARING THE HURDLE

We have the athlete now on top of the hurdle, right leg forward, body forward, left parallel to the top of the hurdle, and at right angles to the right leg. At this point the athlete should start running with the right leg, that is bending his leg slightly and pulling in towards the ground. If he does this he will land a foot closer to the hurdle he took than if he waited until the foot landed before he started pulling.

At this point many hurdlers start bringing the back leg into action too quickly. This will result in



POSITION AT MOMENT OF ALIGHTING

their hitting the hurdle with the ankle, and also they will have a tendency to land with both feet together, and that's a *jump,* not a *run,* and running is our original premise. The back leg should be allowed to come naturally into its stride, neither delayed nor hurried.

Fifteen years ago hurdlers used

HURDLER STEPPING INTO FIRST STRIDE

to throw each arm sidewise in the manner of a man walking a tight rope. This is not running. Some coaches have said that the writer was the first to run over the hurdles with his arms. I thought little about this, except that I did think it a needless affectation. The great Simpson, though, under his coach, H. F. Schulte, now coach at Nebraska University, went further, and threw both his arms forward until the hands nearly touched his front toe in the ascent. On top of the hurdle Simpson is shown on the front cover of this issue with one arm forward and one back. This practice of throwing the hands to meet the front toe has a great deal of good in it. On alighting from the hurdle, the arm that is back should be thrown forward to help the first stride, just as it helps the sprinter.

An ideal stride over the hurdles would be ten feet nine inches, or six feet six inches on the ascent and four feet three inches on the descent. This coming down so close to the hurdle will in the beginning put the novice off balance, and he will have a hard time getting a natural stride for the next hurdle. Patience will remedy this in time.

In running low hurdles, everything is the same as in the high fences, except that one need not bend so far forward in the ascent, and the back leg need not be brought so high. Indeed, one should hit the low hurdle with the back knee if one hits it at all, and many fine performers over the high hurdles would be better at the low sticks if they did not have this habit of throwing the back leg parallel so ingrained.

Assiduous practice over one hurdle for form will bring success in the hurdles. Three or four weeks before the first meet, from three to five hurdles should be raced over. Practice four times a week on hurdles, with a spin at the full distance once during this time is the best training for the hurdles. The rest of the time should be given to sprinting.

Three or four photographs here shown were taken of the writer by Dr. Monilaw, athletic director of University High School of Chicago, about ten years ago. Many college hurdlers have now gotten the points I tried to bring out much smoother, but for purposes of illustration they will suffice, especially as I have none better at hand.

EDITOR'S NOTE

This picture shows Nicholson after he has landed taking his first step. Note that he has landed close to the hurdle, that his right arm swings forward with his left leg, that his left arm is back ready to be swung forward with his next step, and that his body is well forward. Some hurdlers hit their heels when landing. It will be noticed that Nicholson alights on his toe and, so to speak, lands running. A great deal of his success lay in his quick recovery after clearing the hurdle. The vigorous arm action is of value in getting up speed between the hurdles. Note how Nicholson uses his arms as an aid in running.

SUGGESTIONS FOR RELAY RACING

Value of Relay Racing

Relay Racing has grown in popularity both with spectators and coaches for the reason that relay races are intensely interesting from the standpoint of the man in the stands, and the coach finds that in developing teams for relay races he likewise is training men for the sprints, quarter, half, mile and two mile runs in his later meets.

Requirements

It is a difficult matter to get four good quarter milers, four good half milers, or four good mile runners, and the coach who has four good men, even though none of them are exceptionally brilliant, has a good chance to win from a team made up of one or two stars and one or two poor men. The medley races are designed primarily for the school that has a good man in each of the running events, but not four men who can run the same distance.

Placing the Men

It is generally considered advisable to run a good man first, but to have the best man on the team run last. As between the other two men, it is well to run the poorest man in third place and the other second. Of course, this order will have to be changed sometimes —for instance, if a certain man cannot judge pace, it is well to try to place him so that he will be touched off as nearly even with his dangerous opponent as possible. Or, if a runner has a tendency to get too nervous while waiting for the baton, he should be started first, other things being equal. Sometimes it is well to start a big strong runner so that he will not be crowded out at the first turn.

Running the Race

The various races in a relay should be run much as they would be run in straight events, with these exceptions: first, there is the matter of the possible uneven start of all but the men who run first. Some very interesting problems are here presented. Some of them are as follows:

(a) A quarter miler is touched off some fifteen to twenty yards behind an opponent. Should he make up the distance at once?

Answer: No. He should run his own race and strive to cover the full distance in the shortest possible time for him and not bother with the rival runner.

(b) If a member of a four mile team is touched off fifteen or twenty yards behind, should he run his own race or try to pick up the man in front?

Answer: In this case, if the other man does not set too fast a pace it is well to catch up to him and then let him set the pace, provided, of course, he will run the race to the trailer's liking.

(c) If a runner is touched off quite a distance in front of his rival, how should he run his race?

Answer: By all means he should strive to judge his pace just as he would if he were running all alone in a time trial.

In running relays, as in all races, the runners should take care not to run wide on turns, and they should remember at the end of their run to manoeuver to a good position for the exchange of the baton.

Passing the Baton

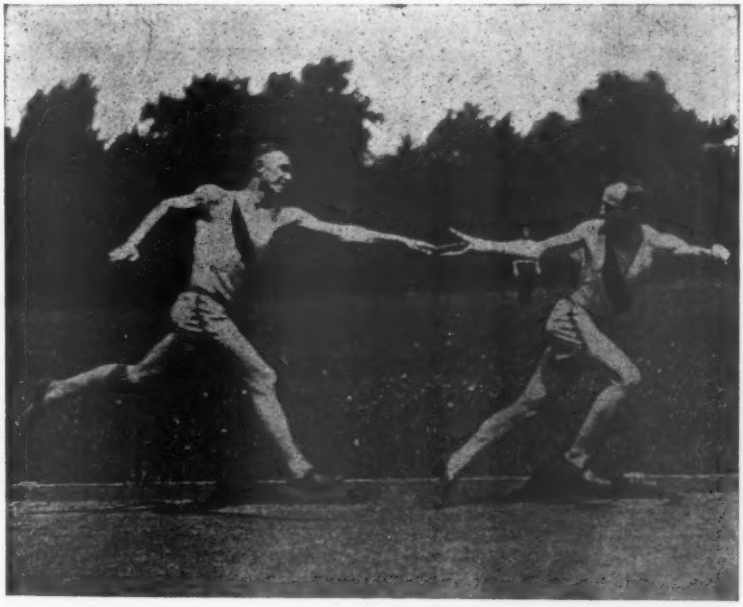
There are two methods usually employed in receiving the baton. First, the receiver reaches back in the natural manner of holding the hand when reaching back for an object. This is the best method, for these reasons: it is the easiest manner of grasping an object; that is, the muscles are not constrained and because of this there is not so much danger of dropping the stick. A great deal of responsibility for a safe exchange should be placed on

the receiver, because the passer is usually tired and sometimes groggy when the exchange is made and consequently may not be able to lay the baton in the outstretched hand. When this happens, the receiver will have to move his hand quickly to grasp the stick before it falls.

The other method of holding the hand to receive the baton is for the waiting runner to turn the out-

Shifting the Baton

Practically all runners pass the baton with the left hand and receive it in the right. This raises the question regarding the stage in the run where the baton should be shifted from the runner's right hand to the left. In most cases it is well to make this shift soon after the baton is received, because then the runner is fresh and not so likely



This illustrates the proper method of passing and receiving the baton. Note that it is passed when both runners are in full stride.

stretched hand palm downward and then, by turning it to the right, present the palm to the passer. This tightens the muscles and makes it hard for the receiver to move his hand freely for a safe exchange. The advocates of this method of receiving the baton point out that the receiver, after grasping the implement, swings his hand forward with his running stride and does not need to first turn his hand over. In fact, this movement is a trifle faster than the one in the other method, but since it is not so safe, the first method is preferred.

to drop it as he is at the end of the run where he may be fighting for a good exchange position.

The Finish of the Race

The runner should plan as soon as he comes into the straightaway in the final lap, how he will pass the baton to his teammate. If the next runner has the pole, his problem is usually simple; but if he is stationed out in fourth, fifth or sixth place, the man finishing the race will have to plan not to trip an opponent or to be tripped when there are a number of runners finishing close together. In this case

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PHYSICAL TRAINING AND SPORT IN GERMANY

BY
SEWARD STALEY
Director of Required Physical Training, University of Illinois

Mr. Staley has recently returned from Germany where he made an exhaustive study of developments in Physical Education, and probably is more of an authority regarding modern German physical training than any other American. His report of the German national program will be of interest to every physical director in this country.—EDITOR'S NOTE.

THE recent war has been productive of a great many social, political, and educational changes in Europe. Along with these other changes has come a tremendous advancement in physical training and athletic sport. To one who has traveled through Europe studying this work, it seems that the whole continent has suddenly awakened to the tremendous significance of formal and recreational physical activities. And of all the countries which have made great advancements in this field, Germany has, from my investigation, made not the least.

There is a higher percentage of amateur athletics, or rather individuals, taking part in some form of amateur athletics in Germany than any other country in the world. Dr. Carl Diem, chairman of the German Olympic Committee, gave me some figures which I herewith submit in substantiation of this statement.

The various athletic activities have highly organized national federations and have registered participating members of the following numbers:

Turners (Gymnasts)	1,500,000
Soccer Football	1,000,000
Track & Field Athletics'	800,000
Swimming	200,000
Rowing	80,000
Bicycling	60,000
Wrestling	30,000
Tennis	10,000
Fencing	15,000
Golf	10,000
Boxing	5,000
Total	3,710,000

This represents only the number registered in national organizations. Dr. Diem assured me that there were nearly half as many again participating in some recognized form of athletic activity who were not registered. Allowing for duplications, etc., it is fairly safe to estimate that the number exceeds five million.

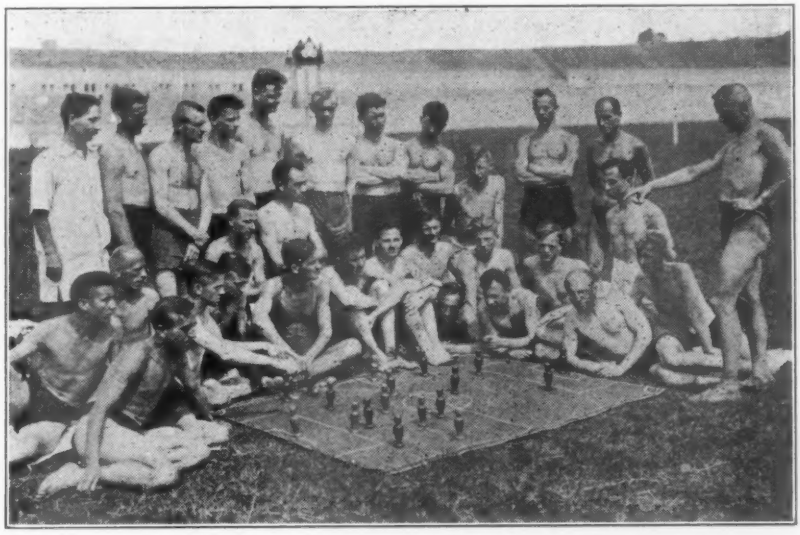
I spent three months in Germany studying this work, and from my observation, which extended to all parts of the country, I am convinced that this number is not too high. I might add that athletic activity is not confined only to men and boys. Girls and women are taking part in large numbers, and I was repeatedly informed that the number was increasing rapidly.

Athletic sport also is not confined to the activities mentioned above, but includes four other games not known in this country, which have a tremendous following there: Schlagball (hit ball)—a sort of mixture of cricket and baseball; Faustball (fist ball)—similar to volley ball; Handball—a mixture of soccer and basketball; and Schlendarball (sling ball)—played with a ball similar to a light medicine ball with a handle on it; this game is played by two teams, each attempting to throw the ball in the other's goal, a space marked on the ground. These sports are considered distinctly national, as baseball and basketball are here, and have a tremendous following. City, section, state and national championships are held in each of them annually.

Before the war the Turner societies which abounded throughout

the country, confined their activities largely to gymnastics. Since the war, I was repeatedly informed, and further saw with my own eyes, that these organizations if not lessening their interest in gymnastic work, are at least devoting a greatly increased attention to athletics, soccer, track and field, rowing, swimming, and so forth; the tendency is away from gymnastics toward athletic sport.

In expression of this new trend of mind, the government is now considering the passage of a compulsory physical training law. The only reason the law has not been passed is that the legislators cannot agree as to the nature of it. Compulsory physical training has existed for a long time in the elementary and secondary schools. The present consideration involves principally (1) the idea of health camps for young men and women, and (2) more play space in the cities. Before the Versailles treaty, Germany relied on her compulsory military training laws to keep her young men fit. Denied this opportunity, now, the proposal is to have a compulsory physical training law whereby young men can be assembled annually for a period of six months or longer and through a thorough course in physical training, including gymnastics, football, track and field athletics, swimming, rowing, and other athletic activities, be placed at the top of their physical condition. If this proposal goes through and gets by the French watchdogs, those who are familiar with the value of physical training in warfare must realize that after all Germany was the great benefactress of the Versailles treaty. I shall not rhapsodize over the other advantages of such a law, but I might point out that if it does go into effect, the American people can offer now a fond farewell to Olympic championships and all such.



The above illustration shows a class in soccer in Germany studying tactics and strategy.

The second aspect of the proposed legislation involves the laying out of greatly increased playing areas in the cities. The proposal is to make each city establish play areas—so many square meters per capita. If this is done it

(Concluded on Page 29)

The ATHLETIC JOURNAL
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OUR FIGHTING GAMES

The discussion concerning competitive athletics which was started by the speeches of two or three college presidents and by the action of some of the mid-western universities in enforcing self-imposed rules, will result in good for our school and college athletics, not only because the attacks will have a tendency to rid athletics of some of the evils which threaten them, but also because out of the discussion athletics will be justified and consequently more firmly established.

The idea back of our fighting games is basically and fundamentally sound. If we have failed somewhere along the line in the administration of our games, or if we have permitted evil tendencies to creep in, let us improve our administration and let us wipe out the evils, but let us hold fast to those institutions which are so much a part of our American life and so necessary in developing character, stamina and a high degree of sportsmanship.

Many of the outstanding features of our athletic system are inherent in American characteristics. It is not the purpose of these observations to defend or assail these national characteristics. If we have gone too far in placing a premium on success, let others decide; but the fact remains that our games will be no better and no worse than our national consciousness. The boy will try to play up to the standards set by his fathers; the coach will do everything humanly possible to win the games that the faculty, the alumni, and the public demand that he win. In the late war many officers were sent back to the States because they did not take the objectives they were commanded to take. No excuses were acceptable. The coach of today must take his objectives or give way to another. It does not matter whether he has as many guns or as fine accoutrement as his opponents—he is expected to win. In the five smaller universities that belong to the so-called Big Ten, or Western Conference, there is only one coach of a major sport who has held his position for ten years, while in the five larger universities that belong to this Conference, six or possibly seven men have out-stayed the ten-year limit.

THE JOURNAL is not wasting maudlin sentiment over the losers—in athletics we shed no tears for the man who gets licked—but it would like to say a word for the school and college coaches who have played the game according to the rules, even while they realized that they were more likely

to be judged by the figures in their percentage columns than by their methods, and to suggest to those who would hold the coach responsible for all the ills in athletics that the reason for the undue emphasis upon winning often lies back of the coaches.

The coach of today must continue to observe the rules and must teach his boys respect for the rules; he must combat gambling as the greatest foe of amateur sport, he must avoid everything that is small and underhanded, and, above all, he must remember that his job is to make men.

NATIONAL PHYSICAL FITNESS

The article by Seward Staley in this issue of the Journal challenges the attention of every student of Physical Education. The fact, which he points out that Germany is striving to come back not by military training, which is forbidden by the allies, but by an intensive form of compulsory physical training is significant. In this connection we need to be reminded that the ancient Greeks founded their military power on their national system of physical training; that the basic combat unit of the Roman Legion was the individual soldier trained for hand-to-hand fighting; that Father Jahn laid the basis for Germany's twentieth century greatness by instituting a system of physical training designed to develop the essentials of good health, discipline and educated bodies.

Here in America we are not to have universal military training not because it is forbidden by foreign powers but because our people are opposed to it. Are we then to have universal physical training? Some of the States have passed compulsory physical training laws and congress has before it a bill which provides for governmental encouragement and aid in physical education for the different states. Congress however has so far failed to pass this needed legislation and the responsibility for the physical training of our citizenry rests with the schools and colleges. The draft figures show that we were derelict in our duty in this respect before the war. Germany is not losing the opportunity of building on a sound physical foundation, let us not lose sight of our responsibility.

N. C. A. A. MEET

The National Collegiate Athletic Association Track and Field Meet will be held this year in Chicago, on Stagg Field, June 17. This meet should become one of the greatest annual events on the national sport calendar. The National Collegiate Athletic Association, under whose auspices and management this track meet is held, is composed of nearly two hundred of the leading colleges and universities in America. The meet will be held after all of the conference and sectional meets have been finished, and, consequently, the N. C. A. A. meet will provide an opportunity for the winners of the conference meets to come together in competition.

THE REACTION TIME OF ATHLETES

BY
SAMUEL A. LEVY

Mr. Levy is an upperclassman in the Coaching Course, University of Illinois. His study is of value, especially to the coach who is training sprinters and hurdlers. but the matter of reaction time is of value to all students of athletics.—EDITOR'S NOTE.

SUCCESSFUL achievement in athletics demands the highest mental and physical qualities. Until recently, however, the physical qualities have received far more attention than the mental. Now the psychologist is especially interested in the mental aspects of athletic performance. For him the problems of vision, audition, memory, association, habit, instinct, emotion, thought and reaction are very important problems.

"A very important problem for the coach is that involved in the selection of men. A coach in any branch of athletics experiences nothing more disheartening than to spend three-fourths of his time upon men who cannot finally be used. In football, for example, it is absolutely necessary for the coach to know how long it takes his men to charge after the ball has been snapped. In this situation a few thousandths of a second may make the whole difference between a good and a bad linesman. The psychologist can and does devise tests designed to measure the ability involved in all cases of athletic performance."*

A fundamental problem in the psychology of athletics is that of reaction time. The importance of reaction time in all branches of athletic endeavor is very apparent. The ability of an athlete to start at the report of a gun or any given signal with the least loss of time determines in a large measure his success and that of his team. For example, a track man who reacts quickly to the gun without any apparent loss of time clearly has the advantage in the race.

The general problem in experimentation on reaction time is as follows: to produce certain definite impressions on the sense organs, to secure a definite result in the form of motion of some part of the body as an indication that the impressions have been received, and to measure with accuracy the interval between the stimulation and the resulting motion. This interval (between the instant the external stimulus begins to act and the instant of the resulting movement of some body part) is termed the "reaction time."

As an illustration, let us take a sprinter on his mark. A gun is fired (stimulus), the sound is heard by the ear (sense organ), and the runner leaves his mark (resulting motion). The time elapsing between the firing of the gun and the leaving of the mark is in this case the "reaction time."

The above example illustrates a case of "simple reaction time." But even "simple reaction time" is a complex affair. It involves several processes: the action of the stimulus on an end-organ, excitation of the sensory nerve, conduction of the impulse over the sensory nerve tract to the spinal cord or to the base of the brain, transformation of the sensory into the motor impulse, conduction of the motor impulse through a motor nerve, and finally the setting free of muscular movement.

There are two kinds of simple reaction time, sensory and muscular. Reaction time is sensory when the subject directs his attention toward the coming stimulus (in our experiment, the sound). Reaction

*Dr. C. R. Griffith, Department of Psychology, University of Illinois.

time is muscular when the subject directs his attention toward the movement to be made (in our experiment, the tapping of a key).

In these experiments the simple reaction time both sensory and muscular is determined. The experiments were conducted with four groups of subjects, classified as follows:

Group A — Athletes of varsity caliber.

Group B—Men with some athletic training (coaching school students of the University of Illinois).

Group C—Men with very little or no athletic training.

Group D—Members of the University of Illinois coaching staff. All these men had engaged in athletics, some many years back, others but a few years ago. The majority of these coaches are beyond thirty years of age.

The instrument used is the Vernier chronoscope, which measures the reaction time in fiftieths of a

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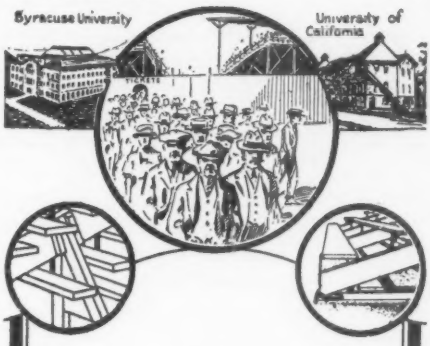

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second. The experiment involves one sense department, auditory stimuli being used exclusively. The conditions of the experiment are simple and consequently not confusing. The subject is acquainted with a definite stimulus (sound from the tapping of a key) to which he is to react with a definite movement (tapping of a key). He shuts his eyes and is warned a few seconds in advance to "be ready" for the coming stimulus.

For the sensory reaction the instruction was such that the subject naturally attended to the coming stimulus (the sound).

For the muscular reaction the instruction was such that it prompted the subject to attend to the movement to be made (pressing of a key).

Each subject was given fifteen tests in the sensory phase of the experiment and a like number in the muscular phase, and the average for each group was computed in thousandths of a second.

Following is a comparative table of my results and the results given by psychologists for a general mixed group of people:

COMPARISON OF REACTIONS
UNIT 1/1000 SEC.

Sensory Reaction to Sound	*Muscular Reaction to Sound*
Group D---104	Group D--- 94
Group A---106	Group A---106
Group B---118	Group B---106
Group C---122	Group C---110
General Group --225	General Group --120

NOTE: In the preceding diagram the general group is composed of an ordinary run of people, including men and women. The fact that the subjects in Groups A, B and C are college men and therefore a selected group, accounts for the large difference between the reaction time of the General Group and the groups in our experiment.

CONCLUSIONS

1. The muscular reaction for each individual and for each group was lower than the sensory reaction for that particular individual or group. This means that an individual, when he attends to the movement to be made, reacts faster than when he attends to the auditory stimulus alone.

2. Of the three groups of students, Group A had the shortest reaction time, Group B occupied the medium ground, and Group C had the longest reaction time. The reaction time (alike in both the sensory and muscular types of reaction) seems to vary directly with the amount of athletic experience of the subject.

Whether the members of Group A can with more training further reduce their reaction time or whether they have reached the lower physiological limit, is not known. Repetition of the tests (after the group has had more athletic training) will have to be made before a conclusion can be drawn one way or the other.

3. The average reactions for Group D (the coaches) were slightly better than the average reactions of Group A (the varsity athletes). This indicates that age apparently does not influence reaction time. An athlete can evidently retain his reaction time during active life.

4. The above is true under ideal laboratory conditions, where the subject sits at ease. Further experiment must show what influence such psychological factors as emotion, excitement, stress, competition and fatigue have on reaction time.

Question: S. J., Wis.—What do you suggest for the meal just before the race? I generally use soft boiled eggs and toast with weak tea. There are a lot of men who do not like the eggs, as they make them sick.

Ans.: Give them a moderate amount of lean meat and vegetables. The meals should be at least four hours before the meet.

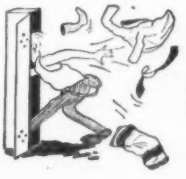
TOURNAMENT PLAY

(Concluded from Page 7)

minutes to play, that team should kill time rather than take chances. A team can stall by keeping the ball in the back court, especially if the opponents are playing a five-man defense. Further time is consumed when the ball is tossed up on held balls, consequently a man who can get the ball on the jump up on a held ball should catch it and permit another held ball and thus keep on jumping and holding the ball indefinitely. Another way of using up time is to pass out of bounds at the far end of the floor.

Finally, the team should be instructed to take out time when the opposition is enjoying a winning rally, and avoid taking out time if possible when things are breaking good.

These are small matters, but many college and school teams do not pay enough attention to them in crucial contests.



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CONCENTRATION IN ATHLETICS

BY
O. H. VOGEL

Mr. Vogel, who has won his letter in football and baseball at the University of Illinois and who is now a member of the varsity basketball team, was last year one of the leading batters in the Intercollegiate Conference. He has made some interesting observations in this article regarding important elements in athletic performances and athletic coaching. It is possible that some of the JOURNAL *readers will add further suggestions regarding these matters.*—EDITOR'S NOTE.

WHAT amount of success in athletics is due to concentration? No definite experiments have been made along this line, though coaches and athletes have been approached on the subject at various times. Without a doubt, when a new event is being learned, every move is concentrated upon, until it is thoroughly learned by repetition. However, on what does an athlete concentrate after all of these movements have become mechanical, so that he may get the best results out of his efforts? It is understood that there are many things to be considered in the success of athletics, such as nervous energy, mental and physical poise, but without concentration, in the performance of an event an athlete will not be successful.

The batter, in baseball, should concentrate on the ball and not on his muscular action. It is true that "a good eye" refers to good eyesight, but this also means concentration on the ball. To prove my point I conducted a series of tests with two men in fielding, batting, and throwing. One hundred trials were made each way. In batting they were first told to concentrate on the muscular movements of the arm and body, and to forget the ball until it was directly in front of them and then to hit the ball. Both hit close to seventy-five. They were then told to concentrate on the ball, forget their muscular action, and swing naturally. Both hit over ninety. No curves were used, the pitched ball being fairly fast. Next they threw at a target. First they concentrated on the muscular action of the arm and body, forgetting about the mark at which they were throwing until the ball was about to leave their hands. Then they threw it naturally, concentrating on the mark at which they were throwing. Twenty trials were made by each and it was found that concentration on the mark brought the best results. In fielding the subjects were told to watch the ball until its last hop, then to concentrate on their muscular action and the place to which they were to throw the ball. After this they were told to watch the ball until it was in their hands. It was found that the latter brought the best results. These trials show that the best result is gained by concentration on the ball in hitting and fielding, while in pitching it is the target. Since only a small number of subjects were used in conducting these experiments the results are not conclusive, but they furnish food for thought.

In football in place and drop kicking, the concentration is on the ball. The kicker has a mental picture of the goal posts, and of the opposing players rushing in, but everything centers on that spot of the ball, where his toe will meet the oval. In punting it is again the ball and not the leg action upon which the concentration is centered. To get the best kick the foot must meet the ball squarely and neither end of the ball must be tilted when dropped. In passing, a mark is concentrated on, this being either a man or a mark on the field; no experiments have been made to prove this conclusion and my information has been gathered from players and coaches at the University of Illinois.

In practically every track event the thing to be considered is the form in the event. In starting, the essential thing is to get away quickly from the mark. In practice one should continually imagine the "on your mark", "get set", and the gun. A slow man, by practicing this, will be able to get away much more quickly than a faster man. The sprinter should concentrate on arm and leg action to get away fast, and not on the report of the pistol. Sprinting consists of a quick driving leg and arm action. In practice, form in running is concentrated upon. In a race, however, it is not the form that counts, but the speed with which the ground is covered. All concentration should be on a quick drive with the arms and legs, so as to get more speed. Hurdling takes in two things: stride and form in going over the hurdle. These are continually drilled upon in practice and in the excitement of a race if they are

(Continued on Page 26)

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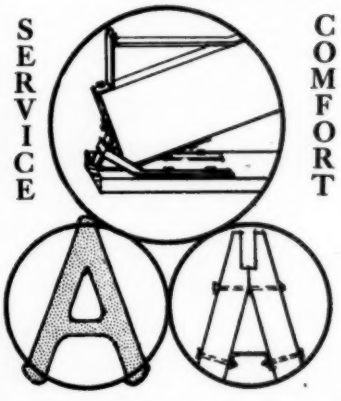

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SUGGESTIONS FOR RELAY RACING

(Concluded from Page 13)

it is better to work out gradually and not try to hold the pole, and then move out at the touch-off line.

When a man has finished the race, he should either stand still in his lane or move forward. He should never cut to the inside or outside of the track because in so doing he runs the chance of tripping an opponent.

RELAY RULES

The rules in Relay Racing are the same as in running straight events, with the exception of a few special provisions which cover the relay features. Chief among these may be mentioned the following, by way of emphasis:

1. The touch-off zone is marked by a line drawn 10 yards each side of the starting line. The baton must be passed somewhere in this 20-yard zone.

2. One man is not permitted to run two stations.

3. If the baton is dropped, it must be picked up by the man who was carrying it, and in making an exchange it must be passed and not thrown.

4. The relative position of the teams on the starting line shall be drawn for and in these positions the baton shall be exchanged.

DRIBBLING

(Concluded from Page 8)

great deal in practice because it teaches men to handle the ball.

7. Where a defensive man charges an offensive man catching the ball, the offensive man may fake one way, then reverse and dribble toward the basket.

8. With two men against one near your goal, dribble in to draw the guard so as to make a pass possible to the other man; but if the guard covers the other man, take a short shot.

SOME SUCCESSFUL BASKET-BALL PLAYS

(Concluded from Page 6)

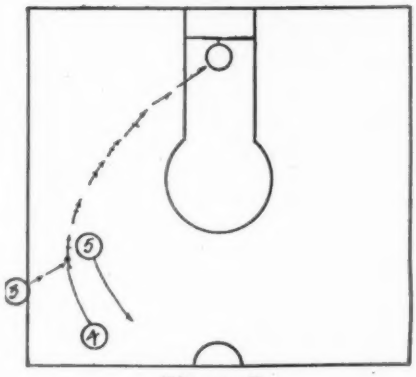

Diagram V

NO. V.

Nos. 4 and 5 line up facing No. 3 and about four or five feet from him; No. 5 cuts away from the basket and No. 4 cuts toward the basket; No. 3 passes to No. 4; No. 4 dribbles in for a shot.

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CONCENTRATION IN ATHLETICS

(Continued from Page 23)

not concentrated upon, one is apt to chop the stride, and to forget the form over the hurdles. It is speed over the hurdles that makes the fast race. Correct form makes for this speed. The shot put depends on form and relaxation of the muscles. In practice some coaches advise their men to aim at a mark, or to try to put the shot up to the best mark they have made. This causes the man to tense his muscles and as a result, to do poor work. If the man in practice will work on form and not on distance he will find that though he puts the shot only 35 or 36 feet in practice he will do much better in a meet.

Relaxation must be concentrated on in the shot, hammer, discus, and javelin. These four events are much alike in all movements, and the same things must be concentrated on in each. The high jumper first must think of his take off. As soon as the take off is accomplished, he begins thinking of his form. The leg is thrown up, the arms are thrown up, the body straightened, then the twist of the hips, followed by the leg snap. All of this must be concentrated on to get the highest jump. The cross bar should be more or less ignored in the jump. The same principle holds true in the pole vault. First the take off is concentrated on so that the pole will hit the mark at the time the vaulter has attained his greatest speed. The arm pull is then centered on, followed by the throwing of the hips over the bar, and then the turn when the pole is pushed away from the body.

In basket shooting, the attention is centered on the rim of the basket. Some coaches advocate following the ball through the air from the hand. However, when throwing at a target, one does not follow the ball, but rather keeps

his eye on the target. In most events where there is a target, the eye is centered on the target and not on the object which is being thrown, shot or impelled toward the target in any manner. Trials were made with the Illinois varsity basketball men; first the men throwing followed the ball with their eyes, then kept their eyes on the target or rim. When following the latter procedure they were more successful. In other words, they had a higher average when they concentrated their attention on the basket rather than on the ball.

In golf, the concentration is centered on the ball and on form. A golfer keeps his eye on the ball. In driving he determines the general direction and then puts all of his attention on the ball. In putting, the final action is centered on the ball. The stance and preliminary swings largely take care of the direction.

Mental concentration plays an important part in every branch of athletics. In baseball, football, and golf, it is concentration on the ball or target. In golf, form is also included. Track and field activities require attention as regards muscular relaxation, and concentration on definite bodily movements. In throwing baskets in basketball, concentration on the basket should be insisted upon. In conclusion, then, first the ability to concentrate one's attention, and second the knowledge as to what object, on which the concentration should be made, are of prime importance in athletic achievement.

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THE CONSTRUCTION OF A HURDLE

MOST coaches have their hurdles built in their woodshops or by a local carpenter. The ATHLETIC JOURNAL has received a number of requests for specifications and dimensions for hurdle construction. The following points should be considered in building a hurdle:

First, the hurdle should conform to the rules and regulations. The National Collegiate Athletic Association requires that the hurdles shall be pinned or fixed so that the gates are rigid. This, of course, applies only to the high hurdles. Further, that the bases or feet of each hurdle shall not be less than 20 inches broad. The top bar shall be a minimum length of 42 inches and a width of at least 3 inches, and shall be painted white; and the weight shall be approximately 16 pounds. There is a reason for all of these requirements. In the first place, it is necessary that the feet be of a uniform size so that there will be uniformity in the matter of tipping over the hurdles in the races. Further, it is advisable to have a minimum length specified. Last spring the writer of this article refereed a Conference dual meet and one of the contestants trailed his leg on going over the high hurdles. However, the hurdles were very short and did not conform to the rule requiring that they be at least 42 inches long. It is well to have all the hurdles painted white so that the men will be accustomed to clearing barriers that all look alike.

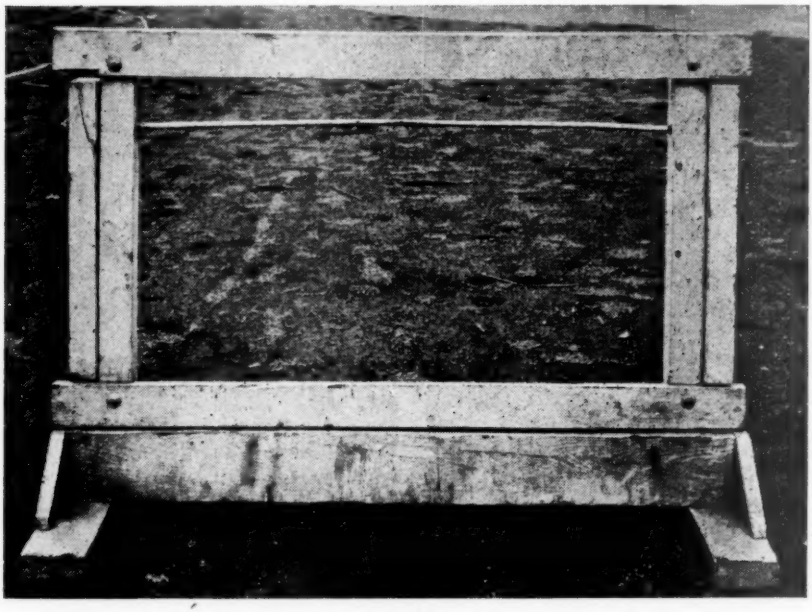

Illustration 1

In the second place, it is desirable to build a hurdle that can be used both for the high and the low hurdle events.

In the third place, it is well to consider the matter of durability and to follow a plan of construction that makes for little waste and to select wood that is free from knots and other flaws. Of course, several coats of white paint will add to the life of the hurdles.

(Concluded on Page 30)

PHYSICAL TRAINING AND SPORT IN GERMANY

(Continued from Page 15)

will simply give athletics and outdoor sports another stimulus thereby aiding and insuring the health and welfare of the nation.

To provide directors for this new movement in physical training and sport, the German Olympic Committee has opened a school of physical training just outside Berlin. The school was opened in 1919 and already, in its third year, has an enrollment of 400 students, thirty of whom are women. The school offers a three year course and covers theory and practice in all sports, theory and practice in gymnastics, free-exercise, and allied subjects, anatomy, physiology, psychology, corrective gymnastics, massage, pedagogy, and so forth.

Most notable of all, however, is the research work that is being carried on. In this field the school is far ahead of any that I have come in contact with and I am familiar with practically all of them, both in this country and in Europe. The school is established at the Stadium that was erected in 1913 for the Olympic Games, which were to have been held there in 1916. The faculty is composed largely of professors from the University of Berlin. All in all, the school has made a wonderful start and bids fair to be one of the leading institutions of its kind in the world.

Question: J. R., Minn.—If a football team is ahead in a close game and the game is nearly up, should it take chances? If the team plays safe, should its actions be construed as unsportsmanlike?

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CONSTRUCTION OF A HURDLE

(Continued from Page 28)

The hurdle shown in the following picture is one made from a plan worked out by a student in the University of Illinois. It is durable and practical. It will be noted that as it stands in the picture, it is of the right height for a low hurdle race. To make a high hurdle of the implement, all that is necessary is to swing the gate. When it is so swung and turned properly, it is impossible for a contestant to kick the gate over without upsetting the entire hurdle. The hand nut at one side of the hurdle makes it possible to tighten or loosen the hurdle, as desired.

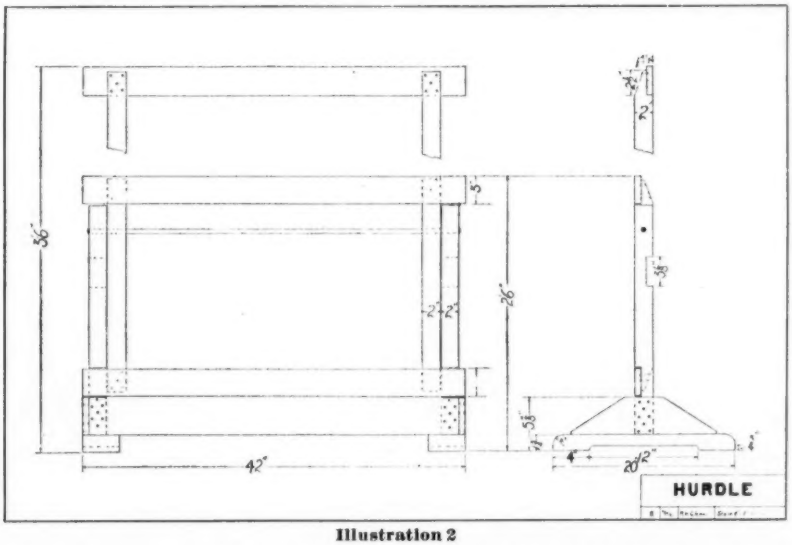

Illustration 2

This hurdle has many features which recommend it to the user: First, it is simple in construction. Second, it can be easily made to conform to the rules. Third, little time is required in changing it from a low to a high hurdle. And, fourth, it is durable.

The second diagram gives specifications of the hurdle. The hurdle is drawn according to a scale of one-fourth inch to one inch. The high hurdle is 3 ft. 6 in. high and the low hurdle 2 ft. 6 in. high; the length over all is 42 inches, top board 3 inches; the end dimension pieces are 2 inches each; the bases are 20 inches long and 4 inches wide; the outside support of the end piece that fits on the bases is 12 inches long. Note the slot at the bottom of the hurdle into which the top piece fits when the hurdle is set for low hurdle racing. Care should be taken in making this slot so that the end support will not be weakened. When Mr. Stagg had the hurdles made last spring for the National Collegiate Athletic Association meet on his field, he made the end pieces out of heavier material than is shown in the diagram on this page, with the idea that the hurdle needed strengthening in this particular.

Ten hurdles are required for a flight of hurdles, whether in the 120 yard or the 220 yard races. It is well to plan for at least six flights, and in some of the larger meets more flights are necessary. This means that at least sixty hurdles should be constructed. However, since hurdles are sometimes broken in the trial races, it is always desirable to have a few extra implements ready at hand.

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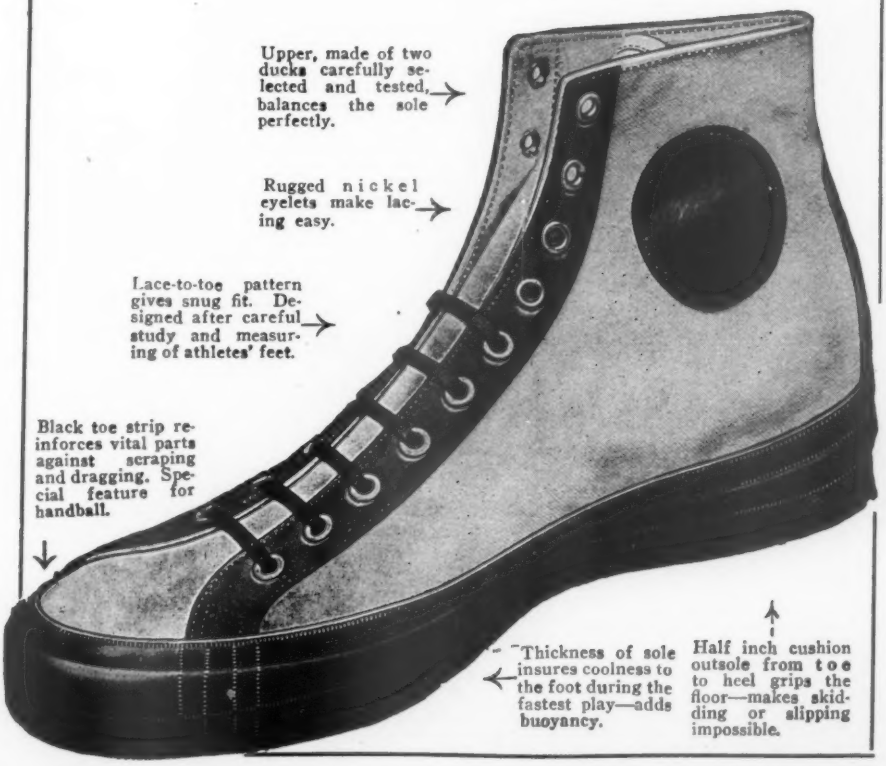
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